Psychological Predictors of Job Performance and Career Success in Professional Sport

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The measurement of psychological factors specific to sport has provided sport psychologists with valuable information for performance enhancement interventions. It is necessary, however, to consider that the predictive validity of the measures when related to job performance or career success in professional sport is limited (Humara, 2000). This literature review describes theoretical and empirical evidence related to (a) utility and validity of psychological measures that predict job performance, including general mental ability (GMA), personality, and emotional intelligence (EI); (b) descriptions of the psychological factors affecting successful and unsuccessful performances at major sporting events such as the Olympic Games; (c) examination of the psychological measures related to performance of successful athletes; and (d) an overview of EI as a construct relevant to job performance and career success of athletes. The aim of the literature review is to present evidence for a systematic method of assessment as recommended by Schmidt and Hunter (1998) that includes GMA and appropriate supplementary measures for sport. A method that encourages the existence and/or development of psychological competencies can enhance the professional experience for the athletes and potentially the return on investment for the professional sporting organization.

Keywords: psychology, professional sport, personality, GMA, EI

Examining individual differences through the development of psychological measures has been the foundation for several applied fields in psychology. There is now sufficient evidence for (a) the validity of various measures and (b) how the measures explain outcomes in the

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relevant contexts. Sport psychologists have also developed measures that relate to performance of athletes in competition. The measurement of psychological factors specific to sport has provided applied practitioners with valuable information for performance enhancement interventions. It is necessary, however, to consider that the predictive validity of the variables in professional sport is limited (Humara, 2000). Research to determine the predictive validity of the psychological measures that relate specifically to successful performance outcomes at the professional level of competition requires further attention.

When examining individual differences, "theories about the criterion situation are as integral a part of the prediction as are test data" (Cronbach & Meehl, 1955, p. 294). In a professional sport context there is a need to clarify the performance outcomes and choose measures that may predict career success at the professional level of competition. Athletes' physical and technical competencies are of primary importance and will dominate selection choices by professional sporting organisations. Many of the athletes selected by professional sporting organisations are young and untested at a professional level of competition. In some professional sports the annual draft (or combine) requires that clubs compete for the best talent in a structured manner as a way of ensuring that the talent is spread amongst all clubs in the league and the less successful clubs can have the best talent to bolster their potential for winning in the future. Those clubs that were last in the previous season of competition have the first picks in the draft and so athletes targeted by a club may not be available because they have already been selected by another club. Recruiting the right athletes is necessary to achieve success but rarely does the method of selection refer to anything other than measures of athletic competence. Furthermore, draft position is a poor predictor of minutes played in the National Basketball Association (NBA; Young) and points scored and games played in the National Hockey League (NHL; Perlini & Halverson, 2006). Young (2008) described how a group of evaluators, including coaches, scouts, player personnel directors, and general managers, assessed talent potential in the NBA draft. In general, draft personnel heavily valued points scored when selecting players. Berri, Brook, and Schmidt (2007) also demonstrated that perceived player value was exclusively related to points scored. There is a need to review how athletes are selected and determine specific standardised assessments that may correlate more strongly with players' performances. Identifying the job performance indicators that relate to career success in a sport is therefore necessary.

A systematic method of assessment as suggested by Schmidt and Hunter (1998) that accounts for the required physical and technical competencies and encourages the existence and/or development of psychological competencies to enhance the professional experience for the athletes and potentially a better return on investment for the professional sporting organisation would be helpful. Providing evidence to athletes and coaches about which psychological competencies lead to career success at the professional level would also enhance the understanding and uptake of sport psychology services.

This literature review describes theoretical and empirical evidence related to (a) utility and validity of psychological measures that predict job performance, including general mental ability (GMA), personality, and emotional intelligence (EI); (b) descriptions of the psychological factors affecting successful and unsuccessful performances at major sporting events such as the Olympic Games; (c) examination of the psychological measures related to performance of successful athletes; and (d) an overview of EI as a construct relevant to career success in professional sport.

Career Success – Validity and Utility of Measures

Predicting future job performance, job-related learning, and job related skills are necessary considerations when trying to select the right individuals to contribute to organisational goals. In many organisations, personnel selection includes psychological testing as a method of prediction. Schmidt and Hunter (1998) summarised 85 years of research investigating the validity of methods used to make decisions about selection. Based on meta-analytic findings, of the 19 methods examined, GMA was considered the primary measure for hiring decisions and the remaining 18 were supplementary. Job performance outcomes were based on dollar value of output and mean percentage of output for an employee and are extremely important to the economic standing and future potential of organisations. The meta-analysis found that GMA predicted 58% of job performance outcomes for professional-managerial jobs, 56% for high level complex technical jobs, 51% for medium complexity jobs, 40% for semi-skilled jobs, and 23% for completely unskilled jobs. The contribution of the supplementary tests to the variance in performance, after GMA was accounted for, ranged from 2% for years of education to 8% for unstructured employment interviews to 18% for conscientiousness to 24% for work sample tests and structured interviews to 27% for integrity tests. Therefore the methods used to make decisions about hiring personnel to achieve workplace goals should include a measure of GMA combined with other supplementary methods.

General Mental Ability

Cognitive ability is the most widely used predictor of job performance (Schmidt, 2002). There are several definitions of cognitive ability. Gottfredson (1997) reasoned that cognitive ability requires reasoning, planning, problem solving, understanding complex ideas, learning quickly, and learning from experience. Schmidt further refined the definition to the ability to learn. Carroll (1993) developed a taxonomy for GMA to enhance the predictive validity of GMA in relation to job performance. An analysis of 477 data sets investigating individual differences in cognitive abilities was conducted. The objective was to present an unbiased assessment of the total domain of cognitive abilities and contribute to the construct validity of intelligence. The outcome of the correlational and factor analytic techniques employed by Carroll was a comprehensive hierarchical theory of cognitive ability that encompasses general (third-stratum), broad (second-stratum), and narrow (first-stratum) abilities. The second-stratum includes seven factors representing (a) process (fluid intelligence, memory and learning, general retrieval); (b) content (crystallised intelligence, general visual perception, general auditory perception); and (c) response time (general speediness). First-stratum factors reflect the effect of experience and learning on specific performance outcomes. Measures can have loadings on more than one first-stratum factor and/or more than one second-stratum factor. There are various tests of GMA representative of the factors included at each stratum of the hierarchical theory.

Schmidt and Hunter (1998) demonstrated that GMA has predictive validity when related to job performance indicators. GMA has shown to predict job-satisfaction (Ganzanch, 1998), leadership (Judge, Colbert, & Ilies, 2004), creativity (Kuncel, Hezlett, & Ones, 2004), and counterproductive behaviours (Dilchert, Ones, Davis, & Rostow, 2007). Judge, Klinger, and Simon (2010) found that over a 28 year period high-GMA participants' growth in income, occupational prestige, and career acceleration were greater than low-GMA participants. High-GMA participants completed more education, completed more job training, and gravitated towards more complex jobs. The measures included arithmetic reasoning, word knowledge, paragraph comprehension, and mathematics knowledge. Lubinski, Benbow, Webb, and Belske-Rechek (2006) tracked participants who were identified in the top .01% on GMA before the age of 13 for 20 years. GMA rankings were based on mathematical reasoning ability or verbal reasoning ability. Based solely on one very high score before the age of 13, the participants achieved occupational success comparable to that

of individuals attending world-class mathematics, science, and engineering graduate programs in the USA.

Adams and Kuzmits (2008) and Lyons, Hoffman, and Mischel (2009) determined the predictive efficiency of GMA in the National Football League (NFL). The measure used to test GMA in the NFL was the Wonderlic Personnel Test (WPT). The WPT is a 50-item 12-minute timed test designed to measure verbal, numerical, general knowledge, and spatial relationship abilities. The NFL draft is held annually and the most promising professional prospects among college football players are asked to complete a series of tests including physical tests and one psychological test (i.e., the WPT). The WPT was introduced as part of the test battery because a coach of one of the NFL teams made the suggestion. There is controversy surrounding the utility and equity of the WPT in the NFL. The researchers collected the data from the internet and related the scores to NFL success. The NFL success factors included draft rank, salary, regular season games, and passing statistics by offensive players. The issue of equity and testing of GMA is well argued (see Outtz, 2002) and particularly pertinent in the NFL where 68% of Lyons et al. sample were African American. The results of both studies demonstrated that GMA was unrelated to NFL performance. Moreover, there were no differences in GMA scores between drafted and non-drafted players.

The data presented by Adams and Kuzmits (2008) and Lyons et al. (2009) is conclusive, but perhaps an alternative to the WPT should be considered. Carpenter, Just, and Shell (1990) suggested that analytic intelligence requires the individual to reason and solve problems involving new information, without relying extensively on an explicit base of declarative knowledge derived from schooling or previous experience in a specific context. Carpenter et al. described the Raven Standard Progressive Matrices (RSPM; Raven, Court, & Raven, 2004) as a classic test of analytic intelligence. Carpenter et al. demonstrated that analytic intelligence measured by the RSPM is central to intelligence and shares considerable variance with other tests of intelligence that are considered measures of crystallised or fluid intelligence (Cattell, 1963). Abstraction and goal management are fundamental to the cognitive processes measured by the RSPM. Abstraction is dependent on high level interpretations of input and information. Receiving new information and generalising this information appropriately to solve presenting problems can enhance adaptation to changing situations and environments. Goal management is generating and managing problem-solving goals in working memory such

that one or more simple solutions in sequence may lead to understanding and actioning complex solutions or concepts (Carpenter et al.).

The evidence provided by Schmidt and Hunter (1998) clearly demonstrates the need to assess GMA when predicting performance outcomes by individuals in many organisational contexts. The evidence for measuring GMA in professional sport is minimal and less than convincing. More data investigating the utility of GMA in the sporting context are required before deeming GMA an unnecessary predictor of performance outcomes. As suggested by Schmidt and Hunter, supplementary measures to GMA also contribute to job performance. Integrity tests contributed a further 27% of the variance in job performance once GMA was accounted for in the analyses. Integrity tests measure traits.

Supplementary Measures to GMA

Personality. There is consensus in the use of GMA tests as a predictive measure of job performance (e.g., Chamorro-Premuzic & Furnham, 2006; Gottfredson, 2002; Ree & Carretta, 2002; Schmidt, 2002; Sternberg & Hedlund, 2002). There is also acknowledgement for the need to better define the contribution that other psychological measures may have in accounting for the variance above and beyond GMA (e.g., Goldstein, Zedeck & Goldstein, 2002; Outtz, 2002; Sternberg, 1999; Tenopyr, 2002). The findings of Schmidt and Hunter (1998) suggested that GMA should be measured along with a supplementary test of integrity. Sackett, Burris, and Callahan (1989) classified integrity tests as measures of conscientiousness. Integrity tests measure factors including responsibility, long term job commitment, consistency, proneness to violence, moral reasoning, hostility, work ethic, dependability, depression, and energy levels. Many of the measures are personality based. A meta-analysis suggested that integrity tests predicted job performance ($r = .21$; Ones, Viswesvaran, & Schmidt, 1993, p. 685).

Certain personality traits are positively related to performance at work as evidenced by a meta-analysis conducted by Barrick and Mount (1991). Barrick and Mount used the Big Five or Five Factor Model (FFM) as a framework to categorise measures of personality used to predict job performance. The FFM includes measures of extraversion, emotional stability, agreeableness, conscientiousness, and openness to experience. The results suggested that conscientiousness was the only factor that showed consistent relationships with job performance criteria, which reflected the findings of Schmidt and Hunter (1998). The other factors

showed some relationships to specific occupations or criteria. Ng, Eby, Sorensen, and Feldman (2005) also conducted a meta-analytic study to determine predictors of career success that were defined as income, promotions, and career satisfaction. Job performance outcomes were more specifically defined. The results demonstrated that neuroticism was negatively correlated to career success. Conscientiousness and extroversion were positively correlated with career success.

Barrick and Mount (2005) recognised the importance of supplementary measures that relate to personality factors but recommended that more emphasis be placed on the construct validity of personality theory and measurement so that a "meaningful taxonomy of lower level personality traits" (Barick & Mount, 2005, p. 369) is developed to improve predictive validity. Barrick and Mount (1991, 2005) stated that there is little disagreement that conscientiousness as a personality trait is beneficial in any occupation. Ng et al. (2005) further concluded that different theoretical models for predicting different aspects of career success would be beneficial. Therefore, job performance criteria that represent career success need to be specifically defined to enhance the predictive validity of any supplementary measures used.

Ackermann and Heggestad (1997) provided evidence of the personality correlates of GMA and reported meta-analytic correlations of $r = -.15$ to $r = -.17$ for psychoticism (Eysenck, 1970), Gf (fluid intelligence), and Gc (crystallised intelligence; Cattell, 1963). Bonaccio and Reeve (2006) and Reeve, Meyer, and Bonaccio (2006) removed the common variance contributing to the correlates supporting the findings of Ackerman and Heggestad and suggested the relationships between personality and GMA were mis-estimated. Therefore, there is apparent overlap between measures of intelligence and personality, so new theories should be encouraged.

Emotional intelligence. The construct of EI is complementary to intelligence and personality. Salovey and Mayer (1990) presented a preliminary conceptualisation of EI as "the ability to monitor one's own and others feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (Salovey & Mayer, 1990, p. 189). Cartwright and Pappas (2008) described the popularisation of EI in organisations as being due to the timing of Goleman's (1995) book *Emotional Intelligence*, which promoted how life success was more dependent upon the way in which individuals managed emotions intrapersonally and interpersonally rather than GMA, race, social mobility, and other socio-demographic factors. After the release of Goleman's book, conceptual

models of EI included additional traits aligned with personality. Goleman defined EI as the abilities to motivate oneself and persist in the face of frustrations, to control impulses and delay gratification, to regulate one's moods and keep distress from swamping the ability to think, to empathise, and to hope. Petrides and Furnham (2001) proposed a theoretical distinction between ability EI, based on maximal performance akin to GMA, and trait EI based on typical performance akin to measures of personality, to promote research investigating the construct validity of both ability and trait EI.

Mayer and Salovey's (1997) ability EI model reflects a four-level hierarchy ranging from basic psychological processes to complex integrative processes. The ability to perceive, appraise, and express emotion is at the lowest level, the second level reflects an ability to use emotions to facilitate cognition. The ability to understand and analyse emotions constitutes the third level, and the ability to regulate emotions to facilitate emotional and cognitive growth reflects the most complex level of emotional intelligence. The most comprehensive measure of ability EI is the Mayer-Salovey-Caruso EI Test Version 2 (MSCEIT; Mayer, Salovey, & Caruso, 2002) and scoring is based on the number of correct answers given.

Trait EI encompasses various traits and learned skills and abilities measured using self-report inventories. Petrides, Perez-Gonzalez, and Furnham (2007) published preliminary evidence for the construct validity of trait EI and defined the construct as "a constellation of emotion-related self-perceptions and dispositions located at the lower levels of personality hierarchies" (Petrides, et al., 2007, p. 27). The aim was to provide a theoretical framework of EI that embraces relationships with personality and lies outside the taxonomy of GMA and could therefore be considered as supplementary to GMA as suggested by Barrick and Mount (2005). Goleman's (1995) model includes four EI clusters that are referred to as competencies: Personal competence, social competence, self-management, and social skills. The Emotional Competence Inventory (ECI; Boyatzis, Goleman, & Rhee, 2000) is the EI measure associated with the model. The ECI is a self-report measure. The most widely used measure of EI is the EQ-i based on the Bar-On model (Bar-On, 1997, 2004, 2006). The term mixed model has been used to define the EQ-i because there is a combination of competencies and facilitators measured. The ECI and the EQ-i are considered to be measures of trait EI (Geher & Renstrom, 2004; Petrides & Furnham, 2001). Other measures of EI are listed listed by the *Consortium for Research on EI in Organizations.*

The MSCEIT (Palmer, Gignac, Manocha, & Stough, 2005) and the EQ-i (Palmer, Manocha, Gignac, & Stough, 2003) have been independently assessed using general population samples. The results did not provide support for the factorial validity of the measures. Currently, the predictive validity of EI measures based on rigorous scientific enquiry is limited (Landy, 2005). Claims made by Goleman (1995) that EI is as strong a predictor of job performance as GMA has led to rapid commercialisation of the construct and measurement. Conte (2005) and Landy are direct in their assessment of limitations inherent in the EI literature. In general, EI measures have acceptable internal consistency reliability at the subscale level, but research confirming (a) the construct validity of EI, ability EI, and trait EI; (b) the factorial validity of ability and trait EI measures; and (c) incremental validity of EI measures beyond GMA and personality is required so that the claims made can be substantiated scientifically (Conte). Day (2004) recommended that future research needs to use the factor or subscale scores, where appropriate, to increase predictive validity of EI related factors. Day describes how scoring of EI measures is also a limitation. Social desirability inherent in the scoring on self-report trait EI measures can lead to the potential for response distortion or faking that has implications for the use of trait EI measures for selection. Brackett and Salovey (2004) describe how the MSCEIT relies on expert consensus scoring where responses are weighted according to the proportion of the normative sample who also provided that answer. The assumption is made that large samples of individuals converge on correct answers. The importance of accounting for GMA in this normative sample would provide a better understanding of how the high-GMA sample responded to the questions as opposed to the low-GMA sample included in normative sample (of over 5, 000 people from various parts of the world).

Various studies have explored the relationships between measures of EI, GMA, and FFM (e.g., Bastian, Burns, & Nettelbeck, 2005; Chapman & Hayslip, 2005; Ciarrochi, Chan, & Caputi, 2000; Derksen, Kramer, & Katzko, 2002; Livingstone & Day, 2005; Newsome, Day, & Catano, 2000; O'Connor & Little, 2003) and the results suggest that there is overlap between the constructs. There is overlap between GMA and FFM (Ackerman & Heggestad, 1997), so it seems appropriate that some overlap between measures of emotional intelligence, cognitive ability, and personality also exists.

Van Rooy, Viswesvaran, and Pluta (2005) evaluated the construct validity of ability EI and trait EI models by conducting a meta-analytic review. The MSCEIT (or earlier versions) was included for ability EI

measures. The EQ-i was one of four trait measures included. The results suggested that ability EI measures showed a true score correlation of .34 with GMA and trait EI models correlated .13 with GMA. Conversely ability EI models showed correlations of < .18 with personality factors whereas trait EI models showed correlations of .27 to .40. The ability and trait EI models diverged more than converged indicating two different constructs existed.

Di Fabio and Palazzeschi (2008) explored the predictive validity of trait EI and ability EI after accounting for GMA and personality in relation to scholastic success (GPA) of students in the last two years of high school. Raven's Advanced Progressive Matrices were used to measure GMA (first step), Eysenck's Personality Questionnaire was used to measure FFM (second step), and the EQ-i and MSCEIT were included as measures of trait and ability EI (third step alternatively). After accounting for GMA and FFM, the relative contributions made by trait and ability EI were significant.

As with all psychological constructs, including GMA and personality, ongoing evaluation of the psychometric properties and predictive validity in specific contexts with reference to valued performance criteria will increase the utility of EI (Mayer, Roberts, & Barsade, 2008; Schulte, Ree, & Carretta, 2004). Research specifically evaluating the EQ-i is essential because it is already the most widely used measure of EI. Arteche, Chamorro-Premuzic, Furnham, and Crump (2008) explored the relationships between the EQ-i, GMA, and personality in a sample of managers and specialists. The results demonstrated that the relationships were not consistent and a significant amount of the variance in the EQ-i was unexplained by personality traits. Van der Zee and Wabeke (2004) examined how trait EI factors, measured using the EQ-i, predicted additional variance over the FFM, when related to ability to support others. The results provided further support for how trait EI can contribute to job performance beyond FFM.

Joseph and Newman (2010) further investigated the EI - job performance relationship based on the conclusions of Van Rooy et al. (2005). Job performance was based on supervisor ratings and the incremental validity of trait EI or ability EI were compared after GMA and personality were accounted for in the analyses. The meta analytic findings presented some evidence for the predictive validity of trait EI measures above ability EI measures. The number of studies included in the restricted meta-analysis was small, but the methodological process was considerate of all the limitations inherent in the EI literature (see Conte, 2005). Practical advice provided by Joseph and Newman suggested that

ability EI measures may add little as a supplementary measure to GMA or personality, and that trait EI measures are a "grab-bag of everything that is not cognitive ability" (Joseph and Newman, 2010, p.72). Petrides et al. (2007) provided preliminary evidence for the trait EI construct and further examination of the construct validity of trait EI as a supplementary measure to GMA seems warranted. The description of trait EI seems to reflect Barrick and Mount's (2005) request for a comprehensive framework or lower level taxonomy of personality traits beyond the FFM as predictors of job performance. Using trait EI as a conceptual framework and refining existing measurement accordingly will help to develop how personality based measures can provide insight as supplementary measures of GMA.

Bar-On Emotional Quotient Inventory

The EQ-i was developed by Bar-On (1997) to better understand and facilitate psychological wellbeing and is based on the model of emotional-social intelligence (Bar-On, 2006). The model is theoretically linked to Darwinian theory of emotional expression for survival and adaptation. Ultimately, being emotionally and socially intelligent means to effectively manage personal, social, and environmental change by realistically and flexibly coping with the immediate situation, solving problems, and making decisions (Bar-On, 2006). The EQ-i contains 133 brief items and provides users with a total EQ score, 5 composite scores (intrapersonal, interpersonal, stress management, adaptability, and general mood) and 15 subscale scores. Bar-On (1997) provided rationale for the construct validity of the subscales by correlating them to clinical measures of psychological functioning (i.e., Minnesota Multiphasic Personality Inventory-2, Personality Assessment Inventory). Relating the EQ-i subscales to the continuum of psychological illness to wellbeing provides an understanding of the competencies and skills required to experience emotionally and socially intelligent behaviour as theorised by Bar-On. Bar-On (2006) stated the inclusion of the 15 subscales and 133 items was based on a combination of professional experiences as a clinical psychologist, experiences of other clinical psychologists, theoretical considerations, and statistical findings. According to the EQ-i technical manual (Bar-On, 1997), the dimensional structure of the EQ-i is 1-5-15 (a general factor, five second order factors, and 15 first order factors). Evidence for the predictive validity of the EQ-i when related to coping skills is relevant to athletes in a professional sport context.

Psychological Factors and Successful Performance in Sport

Sport psychology has developed measures to understand the psychological factors that relate to athletic performance in competition, and based on this evidence applied practitioners have developed interventions to enhance athletic performance in competition. The predictive validity of the measures in professional sport is limited (Humara, 2000), but perhaps job performance and career success as a professional athlete needs to be defined more specifically to provide information and evidence to athletes that may (a) enhance their professional experience, and (b) enhance their understanding and use of psychological services.

As mentioned previously, the NFL in the United States has included a measure of GMA as part of the annual draft to select new recruits to the NFL clubs. Adams and Kuzmits (2007) and Lyons et al. (2009) found no relationship between GMA and any performance outcomes relevant to the NFL and recommended that other psychological measures should be considered. There is no other evidence to cite that has explored psychological assessment in the selection of athletes to a professional sporting organisation. Further investigation of the predictive validity of GMA in sport is necessary. Understanding the experiences of athletes competing at the highest level of competition to determine what factors helped and hindered successful performances may help to determine whether trait EI is relevant in a professional sport context.

Orlick and Partington (1988) suggested that athletes' accounts of their Olympic experiences are an essential resource of information that can guide applied practice. Elite athletes' experiences at Summer and Winter Olympic Games and Commonwealth Games have been documented in the literature (e.g., Dugdale, Eklund, & Gordon, 2002; Eklund, Gould, & Jackson, 1993; Gould, Eklund, & Jackson, 1992a, 1992b, 1993; Gould, Guinan, Greenleaf, & Chung, 2002; Gould, Guinan, Greenleaf, Medbury, & Peterson, 1999; Greenleaf, Gould, & Diffenbach, 2001). The research has predominantly used interview and survey techniques and investigated athletes' experiences, perceived stressors, coping strategies, and ways of dealing with expectations. In general, the studies described how successful Olympians identified factors such as ability to focus attention, quality training including goal setting, competition simulation, mental preparation for competition, and having a plan for dealing with distractions. Much of the research has indicated that successful athletes used psychological strategies to deal with various stressors at competition.

Gould et al. (1992a, 1992b) specifically examined the mental factors and preparation techniques adopted by Olympic wrestlers after the 1988 Olympic Games. All 20 members of the Olympic team were interviewed. Prior to their all-time best performances athletes reported experiencing positive expectancies, optimal arousal states, heightened efforts, and commitment. The psychological skills adopted included systematic mental preparation, tactical strategies focus, and motivational strategies that may have facilitated management of optimal thinking and emotional responses prior to competition. In contrast during their worst Olympic performances, athletes reported experiences of negative emotional states, non-adherence to preparation routines, and negative or irrelevant thinking.

Gould et al. (1999) and Greenleaf et al. (2001) interviewed athletes who met or exceeded expectations and others who failed to perform up to performance expectations at the Atlanta and Nagano Olympics. The results indicated that factors perceived to have positively influenced performance included mental skills and preparation, attitudes towards the Olympics, support services, multifaceted preparation, physical preparation, and coaching. Gould et al. (2002) surveyed Olympic coaches to determine the variables that they thought influenced the Olympic performances of their athletes. At the Games, several variables were perceived to have affected performance. Specifically, coaches thought that variables such as confidence; maintaining (or not maintaining) composure; adjusting tactically; having a plan and being prepared for dealing with distractions, family, and media; and believing that medalling was realistic were all influences. Also, the importance of a positive coach-athlete relationship was recognised.

Elite athletes must successfully cope with a variety of stressors in and out of competition including injury, expectations from self and others, officiating, media, travel, and environmental conditions. Dugdale et al. (2002) surveyed 91 athletes following the 1998 Commonwealth Games and 71 athletes reported that they had to deal with a stressful experience prior to or during their most important performances. Athletes facing expected and unexpected stressors appraised them as something that needed to be accepted or "gotten used to" (Dugdale et al., p. 28). Athletes employed a variety of strategies to cope with the stressful experiences. The most frequently used coping strategies were acceptance, increasing effort, and planning. Few athletes reported using strategies such as venting of emotions, humour, and denial. Interestingly, athletes reported a tendency to not respond or act in response to a stressor. Major factors perceived to have negatively influenced performance included departing from normal routines, media distractions, coach issues, overtraining, and injury.

Research has described the Olympic experience globally and presented psychological, physical, environmental, and social factors that can initiate stressful experiences at competition that elite athletes may need to manage. Based on the rich data provided by successful and unsuccessful Olympic and Commonwealth Games athletes, the ability to manage the stressors that presented before, during, and after competition is predominant. More importantly, there seemed to be a recollection of managing stressors over a longer period of time than just the duration of the competition. The results reflect an ability to cope or a lack of ability to cope. Elite athletes need to learn a number of coping strategies to ensure that when stressful situations present in the lead up to or at major events, strategies can be adopted in a timely manner.

Measuring Psychological Factors in Sport

Research and professional practice in sport psychology have focussed on managing emotions for optimal performance in competition (e.g., Hanin, 2000). Measures of emotions that affect performance in competition include the Competitive State Anxiety Inventory - 2 (CSAI-2; Martens, Vealy, & Burton, 1990), the Sport Anxiety Scale - 2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006), the Sport Multidimensional Perfectionism Scale (MPS: Dunn, Dunn, & Syrotuik, 2002), and the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971; Morgan, 1980) and have been used effectively in research. In applied practice, the measures are often taken at multiple time points and over multiple competitions to determine patterns of how the psychological factors predict individual performance. Measurement has also focussed on sport-specific competencies used in training and competition such as focus and attention (e.g., Test of Attentional and Interpersonal Style; TAIS; Nideffer, 1976), and performance strategies (e.g., self talk, visualisation, goal setting) used in training and competition (e.g., Test of Performance Strategies; TOPS; Thomas, Murphy, & Hardy, 1999). The psychometric rigour of many of the measures requires further investigation. Craft, Magyar, Backer, and Feltz (2003) reviewed the factorial structure of CSAI-2 and cautioned against using the measure in research; Dunn, Dunn, Gotwals, Vallance, Craft, and Syrotuik (2006) failed to support the factor structure of the MPS; and Vallerand (1983) was critical of the psychometric integrity of the TAIS.

The benefit of such measures in applied practice is helping athletes develop awareness of their emotional states in the lead up to and during competitions and employ appropriate psychological strategies to

enhance competitive experiences. Bois, Sarrazin, Southon, and Boiche (2009) collected data using the CSAI-2 and the TOPS from professional golfers the day before an official competition. Success was determined by cut success/ failure and overall ranking at the end of the tournament. More successful players or players that made the cut to continue on in the competition showed higher scores on cognitive and somatic anxiety, emotional control, relaxation strategies, and attentional control. Therefore among professional golfers, successful players can be discriminated by psychological characteristics that relate to coping with anxiety.

Athletes competing at the highest level have to cope with the competitive environment and perform consistently over a number of years to be successful. Therefore measures chosen to predict performance must also reflect coping over time as well as competition-specific experiences. The relative utility of the existing measures in sport psychology as supplementary to GMA requires further investigation when considering career success. Spieler, Czech, Joyner, Munkasy, Gentner, and Long (2007) measured coping skills as one of many factors predicting athletic success in a sample of collegiate footballers. The data collected included biological, physical (e.g., bench press maximum, 40 yard dash), environmental (e.g., size of high school competition), academic, family history, and starting status. The psychological factors measured were coping skills using the Athletic Coping Skills Inventory (ACSI-28; Smith, Schultz, Smoll, & Ptacek, 1995). Although the sample size was small and 81% of the sample was from the same college, the results suggested that age, high school competition, and coping with adversity determined starting status.

Lazarus (2000) suggested that the inability to cope with stress is the reason why athletes fail to function and perform successfully. Evidence demonstrating the coping processes athletes use in response to stressful events is limited (Anshel & Sutarso, 2007). With many definitions, descriptions, and ways of measuring coping, there is a lack of consistency within the sport psychology literature. Researchers have theorised that coping can be subdivided into three unique forms (Lazarus & Folkman, 1984). Problem-focused coping refers to the actions through which individuals try to manage situational demands and reduce the discrepancy between a current situation and a favourable outcome. Emotion-focused coping represents individuals' positive and negative emotional responses to stimuli, and avoidance-focused coping denotes individuals' disengagement from the process of striving actively towards certain goals. Nicholls and Polman (2007) conducted a systematic review of coping in sport and highlighted the methodological limitations inherent in the

available evidence. Of the 64 papers included in the review, 11 found evidence for athletes consistently using avoidance coping strategies to deal with stressful situations. Studies also provided evidence for athletes using consistent strategies in training and alternative strategies for competition. The majority of studies (59%) showed that the type of coping strategies used by athletes were self-selected and depended on the type of stressor that presented. The strategies included problem-focussed, emotion focussed, and avoidance coping strategies. Nine of the studies explored coping effectiveness, or to what extent the coping strategies achieved the objectives. Problem-focussed coping was used when the stressor was perceived to be within the athletes' control, and emotion-focussed coping was used when there was less perceived control of the stressful situation. Most of the studies included in the review were retrospective in nature and the athletes were not all professional or Olympic level competitors. Further research is required validating the construct of coping in sport. A systematic approach to evaluating interventions that are designed to enhance the coping skills of athletes could contribute greatly to applied practice in sport psychology.

The term mental toughness is now well used in discourse describing athletes in competition. Mentally tough athletes cope with the demands of training and competition and maintain control under pressure (Jones, Hanton, & Connaughton, 2002). The predictive validity of any measures is yet to be published because the construct is still being validated (Nicholls, Polman, Levy, & Backhouse, 2008). Mental toughness measures are still in the early phases of development. Examples include the Sports Mental Toughness Questionnaire (Sheard, Golby, & Van Wersch, 2009) that includes a general Mental Toughness factor and three subscales measuring confidence, constancy, and control. Items on the subscales include *"under pressure, I am able to make decisions with confidence"*, *"I give up in difficult situations"*, and *"I get anxious by events I did not expect or cannot control"* (p. 188). The items reflect coping with demands and challenges. There are also mental toughness measures developed specifically for AFL football (Gucciardi, Gordon, & Dimmock, 2009) and cricket (Gucciardi & Gordon, in press) that include similarly worded items. Mental toughness has been empirically related to affect intensity (Crust, 2009), stress and coping (Kaiseler, Polman, & Nicholls, 2009), and optimism, pessimism, and coping (Nicholls, et al., 2008). The scope of mental toughness is seemingly similar to Bar-On's (2006) model of emotionally and socially intelligent behaviour to deal with the demands and pressures of an environment. Research to determine the predictive validity of the psychological measures that relate specifically to successful performance outcomes at the professional level of competition

is also limited. At this stage, there is evidence for the utility of the EQ-i in various contexts including professional sport and should therefore be considered as a relevant supplementary measure of job performance and career success in sport.

Emotional Intelligence in Sport

The relationship between emotional intelligence (EI) and the performance of athletes has been considered (Meyer & Fletcher, 2007) and empirically tested in a sample of male collegiate baseball players (Zizzi, Deaner, & Hirschhorn, 2003), male professional cricket players (Crombie, Lombard, & Noakes, 2009), and male professional hockey players from the National Hockey League (NHL; Perlini & Halverson). The results provided preliminary support for the EI – performance relationship. Zizzi et al. used the EI Scale (EIS; Schutte, Malouff, Hall, Haggerty, Cooper, Golden, & Dornheim, 1998) and measured the relationships between EI and specific pitching and hitting statistics in a sample of collegiate baseball athletes over a season. The results showed that EI scores were not related to hitting statistics and moderately related to pitching statistics. Crombie et al. (2009) used the MSCEIT and demonstrated how the EI of professional cricket teams predicted the team's performance over a season. The results were consistent over two consecutive seasons. The rationale provided to explain the results was that higher EI "amounted to a competitive advantage" (Crombie, et al., p. 220).

Perlini and Halverson (2006) used the composite scales of the EQ-i and measured the EI of male professional athletes playing in the NHL, relating the factors to various performance outcomes that may be considered representative of career success. Similar to Zizzi et al. (2003), specific performance measures such as total points scored were used but the scores were total points scored in the participants' careers to date rather than over a season. Other variables included number of games played in the participants' careers to date, draft ranking, and years since the draft. Perlini and Halverson reported that the athletes' EQ-i scores overall were higher than the population mean (as reported in the EQ-i technical manual). Intrapersonal management (defined as self-awareness and self expression) and general mood (defined as self-motivation) related to number of career points scored in the NHL, whilst general mood also related to career NHL games played after number of years experience was accounted for in the analyses. Interestingly, general mood was negatively related to the performance outcomes. The rationale provide was that mood management was more important to performance, (i.e., adapting mood to

requirements of performing in competition) than being optimistic and happy at all times.

Even though there is preliminary evidence for the EQ-i relating to career success in professional sport, the utility of the EQ-i as a supplementary measure to GMA to predict job performance and career success in professional sport requires further investigation. To date, the only psychometric investigation of an EI measure in sport was conducted by Lane et al. (2009) using the EIS. Confirming the dimensional structure and factorial validity of the EQ-i in a sample of athletes is required.

The EQ-i promotes the development of psychological competencies. Psychologists working with professional athletes could potentially identify those talented athletes who have lower emotional and social competencies and provide them with the training to develop the skills to maximise their professional experiences. Bar-On (2006) described the predictive validity of the EQ-i in relation to various aspects of human performance including physical health, psychological health (clinical versus control samples), social interaction, performance at school, performance in the workplace, self-actualisation, and wellbeing. Based on the preliminary data provided by Perlini and Halverson (2006), the EQ-i may be well suited to predicting performance outcomes relevant to professional sport.

There is demand in the sporting industry to identify psychological factors that predict performance once physical factors are accounted for and there is a certain level of sport-specific expertise attained by the individual. Dealing with environmental demands, challenges, and pressures is necessary for athletes if they want to be successful at the highest level of competition. The EQ-i therefore seems to present a relevant supplementary measure to GMA in possibly predicting performance outcomes in professional sport.

Summary

This review of literature provided a rationale for systematic assessment of psychological factors that relate to job performance and career success in professional sport. The findings of Schmidt and Hunter (1998) demonstrated that GMA predicts job performance across contexts. Adams and Kuzmits (2007) and Lyons et al. (2009) showed that the WPT as a measure of GMA in the professional sport of NFL showed no relationship to any job performance outcomes. It is necessary to further this research agenda before deciding that tests of GMA are not relevant

to performance outcomes in a professional sport context. Supplementary measures to GMA are also considered important predictors of job performance (Barrick & Mount, 1991, 2005; Chamorro-Premuzic & Furnham, 2006; Sternberg, 1999), with integrity tests providing the greatest incremental validity (Schmidt & Hunter, 1998). Ones et al. (1993) provided evidence for the value of personality based integrity tests and Barrick and Mount (1991) provided evidence for the development of more comprehensive personality-based measures beyond the FFM. Trait EI (Petrides & Furnham, 2001) can account for the recommendations of Schmidt and Hunter, Ones et al., and Barrick and Mount. The EQ-i is a measure of trait EI that relates to the experiences of successful and unsuccessful athletes at major sporting events such as the Olympic Games. The EQ-i is based on the theory of emotional and social intelligence (Bar-On, 1997, 2004, 2006) and measures the competencies required to deal with environmental demands, challenges, and pressures of an environment. Perlini and Halverson (2006) demonstrated the utility of the EQ-i when related to career success in a sample of professional male hockey players.

A systematic method of assessment that relates to job performance outcomes and career success in sport will improve the predictive validity of measures used in sport psychology. Based on this review of literature a measure of GMA and a supplementary measure of trait EI such as the EQ-i could be considered. There is currently no evidence for GMA predicting performance outcomes in professional sport, but to determine the relative contribution of EI measures in sport it is necessary to eliminate any variance contributed by GMA. Previous research investigating the EI-performance relationship has only used total EI scores or composite scores rather than the individual subscales scores as recommended by Day (2004). Therefore analyses of the predictive validity of EI need to use the subscale scores. In general, psychological skills related to coping with demands and pressures in and out of competition are recommended for all athletes even though the job performance outcomes may differ from sport to sport. The aim is to provide specific evidence to athletes, coaches, and management that psychological competencies contribute to performance outcomes and can be developed to enhance the professional experience for the athlete and return on investment for the sporting organisation.

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